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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/964,995	09/27/2001	Kazuo Ogawa	N29748500S	2991

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EXAMINER

TRAN, THIEN F

ART UNIT

PAPER NUMBER

2811

DATE MAILED: 10/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/964,995

Applicant(s)

OGAWA, KAZUO

Examiner

Thien Tran

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2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 12-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,5-7 and 9-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 3, 5-7, 9 and 11 are rejected under 35 U.S.C. 102(e) as anticipated by
or, in the alternative, under 35 U.S.C. 103(a) as obvious over Ishitsuka et al. (USPN
6,242,323 of record).

Ishitsuka et al. discloses the claimed semiconductor device (Fig. 32) comprising
a trench element separation region 4 including a trench 4a formed in a surface of a
semiconductor substrate, the trench element separation region isolating separate
semiconductor elements (isolating a first doped channel layer 14 of a first insulated gate
field effect transistor from a second doped channel layer 15 of a second IGFET); an
oxide film 5 formed on inner walls of the trench; a trench filling insulating material 7
filling the trench and having (vertical) edges above the inner walls of the trench, the
edges above the inner walls of the trench are defined by side edges of a sacrificial layer
3; and wherein inner wall edges in a top section of the trench and the edges of the

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trench filling insulating material are formed so as to be essentially located on the same vertical plane when viewed in cross section.

Regarding claim 3, the sacrificial layer is a silicon nitride film.

Regarding claim 5, the semiconductor elements are insulated gate field effect transistors (IGFETs).

Regarding claim 6, the IGFETs include opposite conductivity types.

Regarding claim 11, the first and second doped channel layers (14, 15) are of opposite conductivity types.

The claim limitation "formed by a pull back etching process including a neutral radical that is performed for the trench filling process" in claim 1, "formed by a pull back etching process including a neutral radical performed before filling the trench" in claim 7, and "the etching process includes a fluorine radical" in claim 9 are taken to be product by process limitations. A product by process claim directed to the product per se, no matter how actually made, *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See *In re Fessman*, 180 USPQ 324, 326 (CCPA 1974); *In re Marosi et al.*, 218 USPQ 289, 292 (Fed. Cir. 1983); and particularly *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985), all of which make it clear that it is the patentability of the final structure of the product "gleaned" from the process steps, which must be determined in a "product by process" claim, and not the patentability of the process. See also MPEP 2113. Moreover, an old and obvious product produced by a new method is not a patentable product, whether claimed in "product by process" claims or not. Note that the applicant has the burden of proof in such cases, as the above case law makes clear.

Claims 7, 9 and 10 are rejected under 35 U.S.C. 102(e) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Bhakta et al. (USPN 6,258,697 of record).

Bhakta et al. discloses the claimed semiconductor device (Fig. 3G) comprising a trench element separation region including a trench 40 formed in a surface of a semiconductor substrate, the trench element separation region isolating a first doped channel layer 49 of a first insulated gate field effect transistor from a second doped channel layer 49 of a second IGFET; an oxide film 42 formed on inner walls of the trench; a trench filling insulating material 46 filling the trench and having edges above the inner walls of the trench defined by side edges of a sacrificial layer 34 (Fig. 3E); and wherein inner wall edges in a top section of the trench and the edges of the trench filling insulating material are formed so as to be essentially located on the same plane when viewed in cross section.

Regarding claim 10, the first and second doped channel layers 49 are doped at the same time. It is inherent that the first and second doped channel layers 49 are doped of the same conductivity type.

The claim limitation "formed by a pullback etching process including a neutral radical that is performed before filling the trench" in claim 7, and "the etching process includes a fluorine radical" in claim 9 are taken to be product by process limitations. The limitations recite an intermediate feature that does not exist in the final structure. A product by process claim directed to the product per se, no matter how actually made, In re Hirao, 190 USPQ 15 at 17 (footnote 3). See In re Fessman, 180 USPQ 324, 326

(CCPA 1974); In re Marosi et al., 218 USPQ 289, 292 (Fed. Cir. 1983); and particularly In re Thorpe, 227 USPQ 964, 966 (Fed. Cir. 1985), all of which make it clear that it is the patentability of the final structure of the product "gleaned" from the process steps, which must be determined in a "product by process" claim, and not the patentability of the process. See also MPEP 2113. Moreover, an old and obvious product produced by a new method is not a patentable product, whether claimed in "product by process" claims or not. Note that the applicant has the burden of proof in such cases, as the above case law makes clear.

Response to Arguments

Applicant's arguments filed 07-18-2003 have been fully considered but they are not persuasive. It is clear that the product-by-process limitations "formed by a pull back etching process including a neutral radical that is performed for the trench filling process", "a pull back etching process including a neutral radical that is performed before filling the trench", and "the etching process includes a fluorine radical" recite an intermediate feature that do not exist in the final structure and make the final structure patentably distinguished over the structure of the prior art reference as far as device claims are concerned. Applicant's argument cannot replace evidence when evidence is necessary. There is no evidence of the record (data, lab results) showing that the structures of Bhakta et al. and Ishitsuka et al. are different from the claimed structure.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thien Tran whose telephone number is (703) 308-4108. The examiner can normally be reached on 8:30AM - 5:00PM Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

tt
September 25, 2003



Thien Tran
Patent Examiner
Technology Center 2800